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# Application of conjugate qualitative-quantitative modeling to describe formation processes at oil recovery

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## Abstract

© SGEM2018. The basic idea of conjugate physics-mathematical modeling is a direct transition from the PC to the industrial realization. This promise can be partially implemented by pairing of qualitative and quantitative assessments of the physical and mathematical images. Article systematized and summarized the main provisions and results of our works on this subject. Quality modelling allows to use the law of conservation, de facto directly for microsystems, as well as for macrosystems, being, its type, construction scaffoldings of quantitative research. But pure quality assessment can satisfy neither requirements of science nor, especially, practices. In the following articles on conjugate qualitatively-numerical physical-mathematical modeling we will try to present material allowing to significantly smooth this disadvantage. Structuring of crude oils and their emulsions leads to changes of their warmth-and of the electro-insulation properties, inclinations to oxidation by oxygen of air, their transportation through pipelines is reducing. Magnetic treatment of oil and water wells is contributing to internal pipe surface protection against scale, corrosion and bio-growth besides improvement of properties of oil and water.

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## Keywords

A matter-wave nature, Differentiation and integration of events, Media, Qualitative-quantitative pairing, Wave

## References

[1] Dyyakonov S.G., Elizarov V.I., Kafarov V.V. Combined physical and mathematical modeling of industrial equipment, Doklady. Chemical technology, vol. 280-282, pp 33-37, 1985.

[2] Dyakonov, S.G. Research of molecular mass-transfer on the basis of the method of conjugate physical and mathematical modeling, An engineering physical journal, vol. 59, issue, pp 1016-1023, 1990.

[3] Grossmann J.E. Discrete and Continues Optimization Models for the Dasing and Operation of Sustainable and Robust Process Systems, Computer Aideo Process System Engineering, Kazan, 17-21 jani, 2013-www.ivait.ru.

[4] Ivanov, B. N. A quality approach to assessment of reaction ability of material formations. Message 1, M.: VINITI, No. 2336. – B87-0,4, 1987.

[5] Ivanov, B. N. An associativity of oil-containing systems, Chemistry and fuel and oil technology, issue 4, pp 28-31, 2004.

[6] Mukhamatdinov I.I., Aliev F.A., Sitnov S.A., Vahin A.V., Solodov V.A. Study of rheological behavior of systems 'polymer solution-Rocks', Neftyanoe Khozyaystvo, Oil Industry, issue 11, pp 121-123, 2016.

[7] Ivanov, B. N., Guryanov A.I., Gumerov A.M. Wave processes and technologies of production and preparation of oil, Kazan: AN RT, "FEN".-400 s, 2009.

[8] Ivanov B.N. et al. Energy assessment of processes in channels of oil-bearing stratum, The oil industry, issue 12, pp 69, 1989.

[9] Ivanov B. N., To the question about energy-analytical oil reprocessing process evaluation, Intensification of chemical processes of reprocessing of oil components, The collection between higher schools is Kazan, pp 74-79, 1991.

[10] Petrovici V. La combustion «in situ» assure un taun de recuperation eleve dans important gisement d' huile lourde de Balaria, Recuperation assistee petrole. 2. Collog., Paris, pp 573-584, 1982.

[11] Baviere M., Defives D., Labrid J., Minssieux L. Voies de recherche en matiere de recuperation assistee du petrole par tensio-actifs, Revue de lγInstitut Francais du Petrole, vol. 42, issue 3, pp 327-346, 1987.

[12] Rulenko M.G. Cavitation emulsification,VINITI, No. 7929-7984, 1984.

[13] Lyubartivich S.A., Tretyakova O.V., Ganiyev R.F. Use of wave processes for intensification of chemical and phase transformations in multiphase systems, Theoretical bases of chemical technology, vol. 22, issue 4, pp 560-564, 1988.

[14] Ivanov B N., A.S. №1639730 USSR, MKU B01, F3/08, The means of treatment of oil [et al.]. B.I., №13, 1991.

[15] Ivanov B.N. Prospects of application of magnetic fields for treatment of oil-containing systems, Proceedings of the IVth International conference "Petroleum and gas chemistry", Tomsk: SO RAS, E2, pp 44-46, 2000.

[16] Ivanov B.N. Exploration of associative nature of complex liquid phase systems by heat-visioning methods, A journal of the Kazan technological university, issue 3-4, pp 135-147, 2007.